



Imperial Agricultural Bureaux Third Annual Report OF THE Executive Council

1931-1932

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LONDON: 1933

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IMPERIAL AGRICULTURAL BUREAUX

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LONDON, S.W.1.

THIRD ANNUAL REPORT
OF THE
EXECUTIVE COUNCIL
OF THE
IMPERIAL AGRICULTURAL BUREAUX

The Executive Council of the Imperial Agricultural Bureaux adopted on 7th December, 1932, the following report covering its third year's work—from 1st April, 1931, to 31st March, 1932.

I.—INTRODUCTION

1. At the Imperial Agricultural Research Conference of 1927 many delegates drew attention to the difficulty of keeping abreast of the progress in research work in their particular branches of agricultural science. Owing to the constant development of scientific and agricultural research throughout the world many results of interest to them in their investigations appeared in papers or journals to which they had not access or were printed in languages with which they were not familiar. Time, knowledge and effort were inevitably wasted. Closely allied with this difficulty was the one of forming contacts with workers in other centres. Although these difficulties were perhaps most acutely felt by those working at a distance from large libraries, yet all, including those stationed at old-established institutions, experienced them. The Conference felt that these common difficulties should be met by a common effort. It accordingly recommended the establishment of eight bureaux to collect, collate and disseminate information on research in the following branches of agricultural science, and to assist workers in those branches to form contacts with other workers.

Soil Science.	Plant Genetics (other than Herbage).
Animal Health.	Plant Genetics (Herbage Plants).
Animal Nutrition.	Fruit Production.
Animal Genetics.	Agricultural Parasitology.

The Conference also recommended that each bureau should be located at an Institute already well known for research in its particular branch, and that the cost of the bureaux should be met from a common fund, formed by contributions from Empire Governments. These recommendations were accepted, and at a representative meeting in London in November, 1928, a working scheme for the finance and administration of the bureaux was

prepared. This scheme embodied the principles of the Status Resolution of the Imperial Conference of 1926 and vested the control of finance and administration in an Executive Council composed of representatives appointed by the Governments of the Empire. The scheme was accepted by the Governments and is set out in Appendix I. It came into operation with effect from the 1st April, 1929.

2. The first year of the bureaux's existence was largely occupied in organisation—the selection of staff, the collection of material, the establishment of contacts, the evolution of lines of work. In their second year the presence in London of a number of scientific officers from the Empire overseas as Advisers to their Governments at the Imperial Conference of 1930 afforded a fortunate opportunity for discussions on the work of the bureaux between those Advisers and the members of the Executive Council and Directors of the Bureaux. In the course of those discussions the Scientific Advisers urged those bureaux which had started abstracting journals to enlarge them and others which were contemplating them to start them forthwith. As recorded in the Report for 1930–31 this was done.

The year 1931–32 is thus the first full year in which practically all the bureaux have been issuing printed journals, coming out regularly on definite dates. It was inevitable that during the year the work connected with these journals should occupy much of the attention of the bureaux staff. They therefore figure prominently in this report of the year's doings, but the preparation and issue of an abstracting journal only forms a part, though an important one, of the work of a bureau. The successful issue of these journals looms large in the activities of 1931–32 ; it marks a stage in the service the bureaux are rendering to research workers in the Empire ; it gives the bureaux a definite position in the general scientific world ; but, in addition, progress has been made in promoting contacts between research workers in the Empire, in collecting information of the various lines of research in progress in the Empire, in dealing with special enquiries, and in issuing bibliographies and reviews on subjects of special interest.

II.—PERSONNEL

3. Mr. G. W. Klerck and Mr. A. Yusuf Ali, C.B.E., succeeded Mr. J. Gorst Hubball and Dr. R. P. Paranjpye as the representatives on the Council of the Union of South Africa and India respectively.

4. Among the senior staff of the bureaux, Mr. G. V. Jacks, M.A., B.Sc., was appointed on probation as Deputy Director at the Soil Science Bureau, Rothamsted, in place of Dr. A. F. Joseph, resigned ; and the post of Deputy Director of the Bureau of Animal Nutrition at Aberdeen was filled by the appointment of Dr. F. C. Kelly.

III.—THE YEAR'S FINANCE

5. Most copies of the abstracting journals, as well as most of the other publications issued by the bureaux, are distributed free to selected institutions and research workers in Empire countries, but, in addition, the practice of pricing them for outside sale has been followed. In the first annual report it was stated that—

“Expenditure will inevitably increase as wider regular dissemination of information is secured and as personal contacts are promoted—both of which form the normal development of bureaux work.”

This is still true, but owing to special occurrences in the year, the net expenditure in 1931–32 only exceeded that in 1930–31 by £147.

6. A statement of the audited accounts for 1931–32 is attached to this report. Revenue in the year amounted to £20,194 10s. 7d., of which contributions from subscribing Governments totalled £19,807 10s. as against £19,870 anticipated. The balance, £62 10s., was due from New Zealand. The Government of the Bahamas, which in the first instance had only agreed to support the bureaux for one year, rejoined after one year's absence.

The difference—£387 0s. 7d.—between contributions and total receipts consisted of interest on investments and refunds of Income Tax paid in the previous year.

7. The payments shown in the audited statement are the net expenditure of each bureau after crediting to each its receipts by sales of publications, journals, etc.

	<i>f. s. d.</i>
The estimated gross expenditure in the year was ..	19,545 0 0
The actual gross expenditure in the year was ..	18,490 10 8
The net expenditure in the year was	17,501 11 6

The difference between estimated and actual expenditure, £1,054 9s. 4d., was due to special economies made in the year and to general savings, whilst the difference between actual and net—£988 19s. 2d.—represents the receipts from sales of publications and journals.

Expenditure

8. No capital expenditure—other than on filing cabinets, office furniture and reference books, which form a bureau's stock-in-trade—has ever been incurred. All institutions continue to house the bureaux and provide maintenance services on terms advantageous to the bureaux. As work has increased and methods become more stabilised, purchases have been bulked and thereby more favourable terms obtained. This practice has been steadily extended, so that now nearly all requirements are purchased centrally.

9. Officers and staff throughout the bureaux recognised the general need for economy in the autumn of 1931 and accepted reductions of salary with effect from 1st November, 1931, similar to those enforced in the Research Institutes and in Government Service. In addition, Directors and Deputy Directors have striven to economise, wherever possible, on general miscellaneous expenditure. Though work has expanded, the economies achieved in the year have been substantial.

10. Analysis of expenditure in the year is as follows :—

—	Gross.	Sales of Publications.	Net.	Percentage.	
				Gross.	Net.
At Headquarters—					
General Administration—Salaries, travelling, stationery, postage, rent, accountants' and auditors' fees, etc.	555	—	555	3·0	3·2
Printing—List of Agricultural Research Workers and Annual Report	159	4	155	0·9	0·9
At Bureaux—					
Salaries, whole and part-time, and fees to translators, abstractors, etc.	12,666	—	12,666	68·5	72·4
Printing of journals and publications	2,188	989	1,203	11·8	6·9
Stationery and postage	1,033	—	1,033	5·6	5·9
Purchase of books and periodicals	621	—	621	3·3	3·5
Rent, rates, light, heat, insurance, water, cleaning	599	—	599	3·2	3·4
Travelling, attendance at Conferences	362	—	362	2·0	2·1
Equipment—Filing cabinets, furniture, etc.	218	—	218	1·2	1·2
Contingencies	90	—	90	0·5	0·5
	18,491	989	17,502	100·0	100·0

The foregoing table shows that administrative and overhead charges have been kept at a low figure. The total cost at Headquarters was 3 per cent. of the gross expenditure ; and the total expenditure at all the bureaux on rent, rates, light, heat, insurance, water and cleaning exceeded 3 per cent. by a very small fraction.

Over 90 per cent. of the gross expenditure in the year was, in fact, incurred in the examination, abstraction and distribution of scientific information, and in the purchase of necessary scientific books and periodicals. The small expenditure on books and periodicals (3·3 per cent. of the gross) is due to three causes : the fact that the officers of the bureaux have free access to all periodicals and books received by and belonging to the Institutes to which they are attached ; the number of special libraries in the United

Kingdom to which those officers can refer ; and the free receipt by the bureaux of a number of publications and reports.

Receipts

11. Sales of publications and journals realised £126 in 1930-31. In the next year, 1931-32—that is the one to which this report relates—£989 was realised. This sum was somewhat greater than had been expected because some of the subscriptions for the 1931 issue (its first year of issue) of one journal—the Veterinary Bulletin—were received after 31st March, 1931, and so were credited in the accounts of the year now under review. Most of the journals are issued quarterly. With effect, however, from 1st January, 1932, the Veterinary Bulletin, issued by the Bureau of Animal Health at Weybridge, was enlarged and converted into a monthly publication, the annual subscription being raised from £1 to £2. Sales of this Bulletin accounted for £756 out of the total of £989 received. Other journals contributing to the total of £989 have not such a wide appeal, but taking the general conditions of the year into consideration, the sales for a first full year's working are very satisfactory. In present conditions it is, however, most improbable that the increase in the receipts from sales will be as large in 1932-33 as it was in 1931-32.

Most of the receipts represent subscriptions paid in advance for the journals. Inevitably, therefore, the bureaux enter into forward engagements with their purchasing public on the one hand and with their printers on the other ; these obligations compel the Council as a matter of ordinary prudence to maintain a reserve fund to meet any eventualities.

12. A reserve fund invested in Government securities has been accumulated. This amounted to £12,881 on 31st March, 1932, taking investments at cost. As will be seen from the next table, this fund owes its origin almost entirely to two causes : first, savings effected in the year when the bureaux were being organised ; and second, the fact that the Council has so far scrupulously avoided all expenditure of a capital nature. The Council will continue to endeavour to avoid capital expenditure ; but with concurrent growth of an Institute and in a bureau the question of accommodation must at some time in some cases become acute. To deal with such difficulties the interest on invested reserves, or even possibly part of the reserves themselves, will prove useful. The extent to which the present reserve is attributable to the savings in the first year and to earnings by the Bureaux is clear from the following table :—

Savings during first year when the bureaux were being organised	£	8,907
Interest receipts to 31st March, 1932	..	647
Receipts from sales of publications to 31st March, 1932	..	1,115
Total	£	10,669

13. When the bureaux were started it was anticipated that quite possibly some of the savings from the first year would be required to meet current expenditure in the later years of the quinquennium. As is clear from the foregoing paragraph, those savings have so far been kept intact. In the year under report, 1931-32, two causes in particular operated to prevent any drawing upon reserves, economy cuts and increased receipts. The effect of salary reductions will be reflected in the accounts of the immediately succeeding years, but, as most of the salaries are on time scales, the maxima of which have not yet been reached, an expansion of expenditure under this head must be contemplated. Further, the journals tend to increase in size, though the rate of this increase is likely to be small in the next few years owing to the general need for economy. Moreover, conditions in most countries are tending for a time to check the production of new scientific periodicals, and therefore to check the growth in the number which the bureaux must examine. This general economic pressure, however, operates adversely on the receipts of the bureaux, for several potential subscribers have been compelled to postpone temporarily their purchases of bureaux publications. Although the Council expect that total receipts from this source will continue to increase, they anticipate that the rate of growth will slow down. For these reasons—namely, the effect of time scales on salaries and a slowing down in the growth of receipts—it is probable that the net annual financial expenditure in the year immediately ahead will be somewhat greater than in 1931-32.

IV.—THE YEAR'S WORK

14. The Journals issued are as follows :—

The Veterinary Bulletin, issued monthly from Weybridge.

List of Publications relating to Soils and Fertilisers, issued monthly from Rothamsted.

Plant Breeding Abstracts, issued quarterly from Cambridge.

Herbage Abstracts, issued quarterly from Aberystwyth.

Horticultural Abstracts, issued quarterly from East Malling.

Bulletin on Animal Genetics, issued quarterly from Edinburgh.

Abstracts on Agricultural Parasitology prepared by the bureau at St. Albans appear by special arrangement in the Quarterly Journal of Helminthology, the Bureau obtaining reprints; in addition, that bureau compiles and issues each year a list of the titles and sources of all papers appearing during the year on Helminthology. The journal issued from Aberdeen—Nutrition Abstracts and Reviews—is dealt with separately below.

From the foregoing list it is seen that each bureau has in its own field tackled the difficult problem of providing research workers in the Empire

with means of keeping informed and abreast of the developments throughout the world in their own subject. Taken as a whole, the group covers a large part of the subjects which interest Agricultural and Veterinary workers.

Contacts

15. The most striking general development in the year has been the increasing contacts between the bureaux and research workers throughout the Empire, to which the regular issue of abstracting journals has undoubtedly contributed. For reasons of economy no distant tours were undertaken by bureaux officers and only one Conference—that of Soil Science Workers at Rothamsted—was organised; but many research workers from overseas countries who happened to be in the United Kingdom during the year visited the different bureaux. Dr. Hudson, from Cambridge, represented his bureau at the meeting of the International Association of Plant Breeders at Berlin in 1931.

Technical Communications

16. In addition to the establishment of abstracting journals on a firm basis, most bureaux have compiled and issued in the year special bibliographies on particular subjects of interest to research workers. Most of those bibliographies are preceded by a review summarising the main points in the literature catalogued. By this means workers are supplied with a documented account of the results of research on a particular subject up to a certain date, plus the bibliography theron—a matter of very considerable help to those interested in that subject. A few titles will suffice to indicate the wide range covered and the nature of these publications :—

- Lucerne Inoculation and the Factors affecting its Success.
- Green Manuring, with Bibliography.
- The Technique of the Breeding of Herbage Plants.
- Rice Breeding Bibliography.
- Methods of Field Experiments in Horticulture.
- Bibliography on the Biology of the Fleece.
- Bibliography on Fur Breeding.
- Bibliography on Interspecific and Intergenetic Hybridisation in relation to Plant Breeding.
- Research in Progress on Herbage Plants, Forage Crops and General Grassland Problems in the British Empire—1931.

A list of the various publications still available are given in the Appendix II. The bureaux are always ready to consider the preparation of bibliographies and reviews of literature on special subjects of interest to a large number of workers in the Empire and to compile them as quickly as is consistent with the conduct of their regular work. Where the subject is of restricted interest or where the literature is very extensive, or again, where the information is required rapidly, the bureaux very reasonably

ask that any cost incurred in engaging special assistance to undertake the work shall be provided. It is always most desirable that the subject on which information is required should be defined as closely and clearly as possible. It is no part of a bureau's functions to write scientific text-books.

Nutrition—Abstracts and Reviews

17. Consultations were in progress during 1930-31 between the Executive Council, the General Medical Research Council of the United Kingdom and the Trustees of the Reid Library, Aberdeen, with a view to co-operation in the establishment of an abstracting journal dealing comprehensively with literature on research into nutritional problems. The case for close co-operation in this object between the agricultural and medical sides was undeniable. The literature dealing with the results of research into problems of nutrition is scattered over a very wide range of scientific journals, physiological, biological, medical and agricultural, and many of the results therein recorded are of direct interest both to the research worker who approaches these problems of nutrition as questions of first importance to the human race—the side which concerns primarily the General Medical Research Council—and to the research worker whose first interest is the care of agricultural stock—the side which concerns primarily the Executive Council of the Bureaux. It was clear that greater service could be rendered and the greatest economy achieved by combining to produce a single comprehensive abstracting journal dealing with the literature on research into Nutrition than by producing two abstracting journals, one under medical auspices devoted to abstracting papers of interest to the medical research worker and one under the auspices of the Council devoted to abstracting papers of interest to the agricultural research worker. Had that been done, considerable overlapping between the two journals would have resulted. Co-operation has been secured; and, aided by the munificence of the Trustees of the Reid Library, a journal entitled *Nutrition Abstracts and Reviews* is now issued quarterly from the Animal Nutrition Bureau at Aberdeen under the joint direction of the Executive Council, the Medical Research Council and the Trustees of the Reid Library. The Committee of Management of the Journal consists of Dr. Walter Reid, Chairman, and three representatives from each of the three bodies just named. The joint editors are Dr. J. B. Orr, of the Rowett Institute, Dr. J. J. H. Macleod, of Aberdeen University, and Dr. Harriette Chick, of the Lister Institute. The help of a large number of highly qualified abstractors has been enlisted. The general administrative work is concentrated at the Bureau of Animal Nutrition at Aberdeen. In the first year's issue 3,034 papers bearing on Nutrition were abstracted; and in addition, seven review articles by recognised authorities on particular nutritional problems were included in the journal.

18. In order to meet the costs of abstracting, printing and distributing the journal, the Executive Council and the Medical Research Council have

each undertaken to contribute £400 a year for three years, and over the same period the Trustees of the Reid Library have agreed to meet any deficiency up to an agreed limit. These contributions, as well as all receipts from sales, form the funds at the disposal of the Committee of Management of the Journal. The Journal is expensive to produce, and consequently the Committee are not able to distribute free copies. A charge of £1 1s. a year is made to subscribers. As, however, it has always been the practice at other bureaux to distribute a number of their publications free to institutions and workers in contributing Empire countries, arrangements have been made whereby the Council purchase a very limited number of copies at a reduced rate and cause them to be sent free to selected centres in the Empire. The number so sent is small and cannot be increased.

19. The cost to the Council of these copies for free distribution and the £400 subscription by the Council to the expense of the Journal are included in the expenditure of the bureaux analysed earlier in this report. The receipts from sales of the journals are not included in the receipt (£989) there discussed because they are at the disposal of the Committee of Management and not of the Executive Council. In the first year (1931-32) of issue of "Nutrition Abstracts and Reviews" 499 subscribers were obtained, and in all £632 were received from sales (yearly subscriptions, sales of separate quarterly numbers, and subscriptions paid in advance for the next year's numbers). This is an extremely encouraging result for a first year's working, especially when the widespread economic difficulties of the year are borne in mind.

The Committee of Management are :—

Chairman : Mr. Walter Reid, LL.D.

Representing the Imperial Agricultural Bureaux Council :

Mr. F. L. McDougall, C.M.G. ;
Sir Charles J. Howell Thomas, K.C.B., C.M.G. ;
Sir Robert B. Greig, M.C., LL.D., D.Sc.

Representing the Medical Research Council :

Sir Walter Morley Fletcher, K.B.E., F.R.S. ;
Sir Frederick G. Hopkins, President of the Royal Society ;
Sir Charles J. Martin, C.M.G., F.R.S.

Representing the Reid Library :

Professor H. M. Macdonald, F.R.S. ;
Sir Ashley W. Mackintosh, K.C.V.O., LL.D. ;
Dr. J. F. Tocher, F.I.C.

List of Agricultural Research Workers in the British Empire

20. As was explained in the report for the previous year, this list is now issued from the Headquarters office of the Council. It is the only comprehensive list available showing the names, addresses and subjects of the very numerous agricultural research workers in the Empire and, as such, has proved useful. By means of it a research worker is able, if he desires so to do, to get into touch with any other worker on agricultural research in the Empire. The list gives particulars as on 30th June of each year. Its value clearly depends on the promptitude with which it is issued, and that again depends on the promptitude with which every country in the Empire supplies details of its staff. The compilers of the list are indebted to the chief administrative officers in the different countries for the interest they have taken and for the quick despatch of the information desired. A copy is sent free to every worker whose name appears in the List. In 1931-32 over 2,700 copies were so distributed.

GENERAL

21. The result of the first year's work in issuing abstracting journals gives some idea of the service which the bureaux render. The case of one of the smaller bureaux will suffice as an illustration. Their bibliography of articles published in 1930 of helminthological interest contained 917 titles scattered over 346 periodicals. In all, the number of articles of scientific interest noticed in the various journals of the bureaux in 1930-31 exceeded 10,000. It must be to the advantage of research workers in the Empire to have these brought to their notice in convenient form and at regular intervals. Without the assistance of organisations such as the Bureaux the individual must experience great difficulty in keeping abreast of modern scientific literature. Yet no research worker can afford not to attempt to keep himself so informed. The case for abstracting journals was well put in a recent conference in London: "Abstract literature has become one of the most important weapons in the research workers' armoury."

The Bureau of Fruit Production at East Malling received a few weeks ago the following from a research worker in the United States:—

"Horticultural Abstracts is too good for me not to have it regularly on my desk instead of having to go to the library every time I want to refer to it. The question now is: what will it cost, and how can I secure it? If you send me this information it is possible that I can place three or four orders."

The regular receipt by research workers of reliable up-to-date abstracting journals on their own subjects is a real economy of their time and skill—and therefore an economy for those who employ them.

22. Moreover, the value of the work is cumulative. As, in each bureau, the references in each succeeding year appertaining to its own subject are indexed, analysed and abstracted, compendia of reference of ever increasing value, available to all research workers in the Empire, are built up. The same applies to the abstracting journals and technical communications. If these can be continued and steadily improved over a number of years, they will soon become indispensable works of reference in all science libraries. It is essential that the abstracting should be done by men or women well versed in their subject and well equipped linguistically. In recommending staff for appointments Directors have always rightly insisted on this dual qualification, with the result that, taking the bureaux as a whole, the staff possess very wide scientific and linguistic qualifications.

23. The work of the bureaux is not restricted to the issue of these various publications, journals and technical communications. Their correspondence files show very varied requests, on points directly connected with the particular research on which the enquirer is engaged, on methods of technique, for the supply of a reprint or of a translation of a particular article which the enquirer requires for his work and of which he has heard or may have happened to have seen an abstract in one of the journals. During the year translations of papers issued in most European languages (including Russian, Scandinavian, Hungarian and Polish) and also of a few in Japanese have been supplied by the bureaux in answer to requests. In addition, the bureaux attempt to keep themselves informed of the nature of the research work in progress in the different parts of the Empire, and have assisted in bringing workers in different countries into contact.

The lines on which the work has so far developed are the result of combining the experience of the Directors with the suggestions and requests made to the bureaux by workers overseas. The constant object of the Directors and their assistants is to make the bureaux as helpful as possible, and suggestions which will increase their utility are welcomed by them.

24. From the experience gained the Council believe that the services which the bureaux are called on to perform are in modern conditions indispensable to the effective conduct of research into agricultural and veterinary problems. It is, of course, always possible to close down such research entirely, but to do so is to allow other countries, which continue it, to gain the advantage. It is certainly true that no Government working on a national basis could provide the service the bureaux now render for several times the contribution which it now makes to the common fund, whilst in some countries in the Empire the recruitment of staff with the necessary scientific and linguistic knowledge would be a matter of extreme difficulty and expense. The bureaux offer an outstanding example of national economy secured through co-operation in finance.

F. L. McDougall,
Chairman

EXECUTIVE COUNCIL, IMPERIAL AGRICULTURAL BUREAUX.
ACCOUNT OF RECEIPTS AND PAYMENTS FOR THE PERIOD 1ST APRIL, 1931, TO 31ST MARCH, 1932.

<i>Receipts.</i>	<i>Payments.</i>
Balance on 1st April, 1931 ...	£ 779 1 7
Contributions from the Governments of the Empire ...	19,807 10 0
Miscellaneous Receipts ...	387 0 7
	<i>Working Expenses of Imperial Bureau of—</i>
	Soil Science (Rothamsted) 2,415 16 5
	Animal Nutrition (Aberdeen) 2,247 14 11
	Animal Health (Weybridge) 3,390 7 10
	Animal Genetics (Edinburgh) 1,619 17 1
	Fruit Production (East Malling) 2,058 4 9
	Plant Genetics (Herbage) (Aberystwyth) 1,826 19 2
	Plant Genetics (Non-Herbage) (Cambridge) ... 1,756 9 1
	Agricultural Parasitology (St. Albans) 1,476 1 10
	General Secretarial Expenses 710 0 5
	£17,501 11 6
Purchase of £2,000 (nominal) 6 per cent. India Bonds...	2,112 16 0
Balance on 31st March, 1932—	
H.M. Paymaster—	
General ... £468 16 2	
In hand ... 976 13 9	
	1,445 9 11
Less Suspense Accounts ...	86 5 3
	1,359 4 8
Total ...	£20,973 12 2
	Total ... £20,973 12 2

Investments at 31st March, 1932 :—

£4,000 5 per cent. Conversion Loan, 1944–64, at cost ...	... ... £4,152 16 0
£6,500 4 per cent. Treasury Bonds, at cost ...	... ... 6,615 4 8
£2,000 6 per cent. India Bonds, at cost ...	... ... 2,112 16 0

8th June, 1932.

V. H. BOYSE,

Accountant.

DAVID CHADWICK,

Secretary.

I have examined the above Account. I have obtained all the information and explanations that I have required, and I certify, as the result of my audit, that in my opinion the above Account is correct.

G. C. UPCOTT,

Comptroller and Auditor General.

EXCHEQUER AND AUDIT DEPARTMENT,
26th October, 1932.

APPENDIX I

IMPERIAL AGRICULTURAL BUREAUX

Nothing in these Memoranda affects the Imperial Institutes of Entomology or Mycology which were organised prior to the Imperial Agricultural Research Conference of 1927. These two continue independently in accordance with their earlier organisations.

The following scheme was agreed at a Conference in London in November, 1928, attended by representatives of H.M. Governments in the United Kingdom, Canada, the Commonwealth of Australia, New Zealand, the Union of South Africa, the Irish Free State, the Government of India and the Colonial Office. It has been adopted by the Governments and by the Governing Bodies of the Institutes mentioned in it.

THE SCHEME.

1. The purpose of Imperial Agricultural Bureaux is to act as effective clearing houses for the interchange of information of value to research workers in agricultural science throughout the various parts of the Empire, and for this purpose they should discharge the following functions :—

FUNCTIONS OF A BUREAU.

A.—*Collection of Information.*

2. (i) A bureau should maintain an index of research being carried out in different parts of the Empire and as far as practicable in foreign countries.

(ii) A bureau should begin by collecting, abstracting, and collating information from all sources bearing on the most important problems under investigation in different parts of the Empire ; but care should be taken to avoid the collection of uncorrelated data.

(iii) A bureau should keep itself informed of the general progress of research work within its province in different parts of the Empire.

(iv) A bureau should in appropriate cases summarise available statistics where these are of importance in connection with its work.

B.—*Distribution of Information.*

(i) A bureau should supply, on request, information within the scope of its work to officials and advisory officers, in all parts of the Empire. Where a bureau is not in possession of such information it should endeavour to put the enquirer in touch with the best source.

(ii) A bureau should supply, where feasible, to research workers in the Empire, on request, information including bibliographies and photostat prints of articles on specific problems.

(iii) A bureau should issue information along such lines as may be deemed desirable by the Executive Council.

C.—*Publication.*

The general distribution of information (apart from the distribution of information to particular individuals) is part of the duties of a bureau, but the publication of special monographs should only be made with the approval of the Executive Council, and though in many cases it may ultimately be found desirable to establish a journal such publication should not, on account of its permanent cost, be undertaken until the bureau has become fully established and then only on the authorisation of the Executive Council.

D.—General.

A bureau should not undertake any laboratory or field research work involving expense but, in addition to its main function of facilitating the exchange of information, a bureau will be in a position to be of service to research workers in various ways and especially along the following lines :—

- (i) By facilitating exchange of workers, especially by supplying information in regard to centres between which exchange would be most profitable.
- (ii) By facilitating, through correspondence or otherwise, meetings at the most convenient centres of workers interested in the same problems in different parts of the Empire.
- (iii) By facilitating the exchange of experimental material for research purposes between institutions or workers in different parts of the Empire.
- (iv) By supplying information on the best centres for post graduate study, the best sources of supply of apparatus or equipment and any other such information of a general character which might be of service to institutions or individual workers.

FUNDS FOR THE BUREAUX.

3. The funds for the bureaux will be provided by contributions from the Governments of the Empire.

A COMMON FUND.

4. These contributions will form a common fund for all the bureaux and no part should be earmarked for the service of a particular bureau.

THE EXECUTIVE COUNCIL.

5. The control of the fund, its distribution among the bureaux and the general supervision of the bureaux will rest with the Executive Council of the Imperial Agricultural Bureaux appointed by the Governments of the Empire on the general lines suggested by the Imperial Agricultural Research Conference of 1927.

6. This Council is charged with administrative duties and should consist of one representative of each of the following territories (if and so long as they contribute to the fund) : England and Wales; Scotland; Northern Ireland; Canada; the Commonwealth of Australia; New Zealand; the Union of South Africa; the Irish Free State; Newfoundland; India; Southern Rhodesia; the colonies, protectorates, and mandated territories administered by H.M. Government in the United Kingdom.

NUMBER AND LOCATION OF BUREAUX.

7. Eight bureaux should forthwith be established under the following names and for the present should be attached to the following institutes :—

<i>Names.</i>	<i>Location.</i>
The Imperial Bureau of—	Attached to the—
(1) Soil Science	Rothamsted Experimental Station, Harpenden, Herts., England.
(2) Animal Nutrition	Rowett Research Institute, Bucksburn, Aberdeen, Scotland.
(3) Animal Health	Veterinary Research Laboratory, Weybridge, Surrey, England.
(4) Animal Genetics	Animal Breeding Research Department, Edinburgh University, King's Buildings, West Mains Road, Edinburgh, Scotland.
(5) Agricultural Parasitology ..	Institute of Agricultural Parasitology, nr. St. Albans, England.
(6) Plant Genetics. For crops other than herbage plants	Plant Breeding Institute, Cambridge University, England.
(7) Plant Genetics. For herbage plants.	Welsh Plant Breeding Station, Aberystwyth, Wales.
(8) Fruit Production	East Malling Research Station, East Malling, Kent, England.

8. The first three of these, namely, the Imperial Bureaux of Soil Science, Animal Nutrition and Animal Health should for the present be organised on a larger scale than the remaining five.

DIRECTORS AND DEPUTY DIRECTORS OR CHIEF ASSISTANTS.

9. The Head of the Research Institute will be in each case *ex-officio* Director of the Imperial Bureau attached to his Institute and he will be entitled "Director of the Bureau." In each case there should be at least one whole-time officer paid from the Council's funds, who should be the deputy director or chief assistant for bureau work.

OFFICIAL CORRESPONDENTS.

10. Specialists in the appropriate sciences should be nominated as official correspondents by the Governments represented on the Executive Council—one by each Government for each bureau.

11. In each country the representative of the bureau will be the Official correspondent to whom the Director may turn for such help as he may require and from whom he may obtain suggestions regarding the work and activity of the bureau.

12. It is expected that these correspondents will make it their duty to take a lively interest in the functions and work of the bureau and facilitate its activities in the interest of research workers in the Empire as a whole.

13. The periodical meetings of the Imperial Agricultural Research Conference and any special meetings of those engaged in a particular science will afford opportunities for adjustment of differences of view regarding the work to be undertaken by the bureau. In case of necessity, and when such opportunities are not likely to occur for some considerable time, the Director should refer the case to the Executive Council.

APPOINTMENTS OF STAFF AT THE BUREAUX.

14. The staff of the Bureau in receipt of salaries of £300 a year or over will be selected in consultation with the Director and will be appointed by the Council with the prior consent of the Government Department or Governing Body controlling the Research Institute.

15. The staff in receipt of salaries below £300 will be appointed on behalf of the Executive Council by such method as may be acceptable to the governing authority of the Institute.

16. The scales of pay of all staff will be fixed and sanctioned by the Executive Council in consultation with the Governing Bodies of the Institutes and the Ministry of Agriculture for Institutes in England and the Board of Agriculture for Scotland, for those in Scotland.

17. The staff of the Bureau will be under the disciplinary control of the Director of the Station, and the exercise of such control shall be governed by such rules and procedure as may be agreed between the Governing Authority and the Executive Council.

HONORARIA TO DIRECTORS.

18. Bureaux will receive great assistance from the Heads of the Institutes who become Directors of the Bureaux and the work of establishment and supervision will make a considerable call on their time and attention. The executive Council recognise this fact and whilst, from the nature of the case, they are unable to remunerate the Heads of these Institutes directly, they desire that the Governing Authorities of the various Institutes be requested to agree that the Heads of their Institutes receive from the Executive Council honoraria at a flat rate of 100 guineas a year, which may be described as allowances, honoraria, or remuneration for literary work as the Governing Authority of each Institute prefers.

PROPERTY OF THE BUREAUX.

19. Movable property bought from Bureaux funds should be brought to inventory and should remain the property of the Bureaux.

ACCOUNTS AND FINANCIAL MACHINERY.

20. The accounts of a bureau are to be kept distinct from those of the Institute to which it is attached.

21. The Executive Council will submit annually to the contributing Governments a statement of receipts and expenditure supported by properly audited accounts. Such statement will cover both the expenditure by the Bureaux and expenditure incurred directly by the Executive Council.

22. The accounting year will be for the period ending 31st March each year.

23. Detailed estimates for expenditure in the forthcoming year should be forwarded by the Director of a Bureau to the Secretary of the Executive Council not later than 1st October of each year. These estimates should be in a form to be settled, but should clearly distinguish between the salaries of the superior staff, those of assistants and clerical staff and miscellaneous charges, with reasons for any anticipated unusual expenditure.

24. The rates of pay of staff, charges for rent or new expenditure exceeding £25 not covered in the estimates should not be varied or incurred without the prior sanction of the Executive Council. Otherwise within the totals of the grant for clerical assistance and of the miscellaneous grant the Director has power to reappropriate between subheads during the course of the year.

25. The Treasury in the United Kingdom will be requested to arrange for the opening of a pay account entirely separate from those of His Majesty's Government in the United Kingdom into which all contributions and from which all payments will be made. They will also be requested to arrange for the audit of all expenditure by the Comptroller and Auditor-General under Section 3 of the Exchequer and Audit Act, 1921, under which provision could be made for the report on the audit to be made only to the Executive Council.

26. Advances would be made each quarter by the Secretariat of the Executive Council to the responsible finance officers at each Institute sufficient to cover the estimated quarter's expenditure. Out of that advance such officers would pay all authorised expenses of the Bureau.

27. Immediately at the close of the quarter the finance officer of the Institute would forward to the Secretary of the Executive Council an account in proper form supported by receipts for all expenditure on salaries, wages, etc., and by vouchers for all miscellaneous expenditure. He would be given credit in the central account in the office of the Executive Council for such amount as examination of those vouchers indicated. His requirements for the next quarter would be stated and a further imprest given to place him in funds for the next quarter.

28. All accounts would be brought together in the office of the Executive Council, and these, together with the direct expenditure by the Council would be audited by the Comptroller and Auditor-General who would make his report to the Executive Council.

TRAVELLING ALLOWANCES.

29. Except in special cases and under special sanction of the Council travelling and subsistence allowances of officers subordinate to the Council will be at the rates appropriate to the Research Institute concerned. Travelling and other allowances of members of the Executive Council will be borne by the Governments appointing them.

OFFICE ESTABLISHMENT OF THE COUNCIL.

30. The Council will appoint and dismiss its own Secretary, who will obtain the approval of the Council for the general conduct of its work.

31. The cost of such secretarial work as also any charges for audit will be a charge on the common fund.

CONTRIBUTIONS.

32. As the fund relies solely on contributions from Governments these should become due on the 1st April for the financial year to which they relate.

33. Payments should be made to the Secretary of the Executive Council for credit of the account of the Council at the Paymaster-General's Office in the United Kingdom.

BUSINESS OF THE COUNCIL.

34. The following must go before the Council for their consideration :—

- (a) detailed estimates of the Bureaux,
- (b) the Auditor-General's reports and the annual report of the Executive Council,
- (c) all proposals for new expenditure,
- (d) all appointments within the Council's cognisance.

35. Between meetings of the Council the Chairman, or (if the Chairman is not available) the Vice-Chairman and any two members of the Council, may deal with urgent business but their action must be reported forthwith to the other members of the Council and must be submitted for confirmation to the next meeting of the Council. Ordinarily, expenditure which will involve commitments beyond the current financial year should be deferred for consideration at a full meeting of Council.

36. The Council will ordinarily meet in November and July : in November for the consideration of the Budget and Estimates and in July for consideration of the report and accounts.

37. The Offices of the Council are situated at 2, Queen Anne's Gate Buildings, London, S.W.1.

38. Sir Robert Greig, M.C., LL.D., is appointed Chairman for a period of two years.
Mr. F. L. McDougall, C.M.G., is appointed Vice-Chairman.

The Chairman, Vice-Chairman and Mr. R. V. Vernon are appointed to a panel each of whom can sign pay orders with the Secretary.

Sir David Chadwick, C.S.I., C.I.E., is appointed Secretary.

Mr. W. R. Black, M.B.E., is appointed liaison officer with the Ministry of Agriculture and Fisheries.

MISCELLANEOUS.

39. Contracts of employment where necessary will run in the names of the Chairman and Secretary for the time being on behalf of the Council.

40. All appointments are for the time being to be temporary.

41. All Governments are requested to communicate to the Secretary of the Council the names of the official correspondents appointed to the different bureaux.

42. In the event of a Member of the Council being unable to attend a meeting the name of a substitute shall be communicated to the Secretary.

DAVID CHADWICK,

Secretary to the Executive Council.

APPENDIX II

PUBLICATIONS OF THE IMPERIAL AGRICULTURAL BUREAUX

I. Obtainable from The Imperial Bureau of Soil Science, Rothamsted Experimental Station, Harpenden, Herts.

Periodical Abstracts.

	s. d.
Publications on Soil Science issued from the Empire Overseas during 1929	0 6
" " " " 1930	1 0
" " " " 1931	1 0
List of Publications relating to Soils and Fertilisers. Published monthly, per annum	10 0
Monthly. Letters—Numbers 1-12	Free.
Subscription, outside the Empire, per annum	s. d. 4 0

Occasional Papers.

TECHNICAL COMMUNICATIONS :—

II. Obtainable from The Imperial Bureau of Animal Health, Veterinary Research Laboratory,
New Haw, Weybridge, Surrey.

Abstractive Journal.

THE VETERINARY BULLETIN.

VETERINARY BULLETIN.		s. d.
1931. Vol. 1. Quarterly (1st Number, April)	.. .. .. .. .. .. .. ..	7 6
Annual Subscription	20 0	
1932. Vol. 2. Monthly (1st Number, January)	.. .. .. .. .. .. .. ..	5 0
Annual Subscription	40 0	

III. Obtainable from the Imperial Bureau of Animal Nutrition, Rowett Research Institute,
Bucksburn, Aberdeen.

Journal.

NUTRITION ABSTRACTS AND REVIEWS. (Issued under the direction of the Imperial Agricultural Bureaux Council, the Medical Research Council and the Reid Library.)

Occasional Papers

TECHNICAL COMMUNICATIONS :—

IV. Obtainable from the Imperial Bureau of Plant Genetics, Plant Breeding Institute,
School of Agriculture, Cambridge.

Journal.

PLANT BREEDING ABSTRACTS :—

												s. d.
Quarterly ..	..	..	..	..	..	..	..	..	..	..	..	1 6
Annual Subscription ..	..	..	..	..	..	..	..	..	..	..	..	5 0(a)
Numbers printed on one side of paper ..	..	..	..	..	..	..	..	..	..	..	..	6 0

Occasional Papers.

Wheat Breeding Bibliography. Part 1 ..	..	..	..	..	..	..	..	..	..	..	..	1 6
Part 2 ..	..	..	..	..	..	..	..	..	..	..	..	2 6
Breeding Varieties Resistant to Disease ..	..	..	..	..	..	..	..	..	..	..	..	2 0
Barley Breeding Bibliography ..	..	..	..	..	..	..	..	..	..	..	..	1 6
Lodging in Cereals ..	..	..	..	..	..	..	..	..	..	..	..	0 6
Oat Breeding Bibliography ..	..	..	..	..	..	..	..	..	..	..	..	1 6
Rice Breeding Bibliography ..	..	..	..	..	..	..	..	..	..	..	..	1 6
Bibliography on Interspecific and Intergeneric Hybridization in Relation to Plant Breeding ..	..	..	..	..	..	..	..	..	..	..	..	2 0
Account of the Research in Progress in the British Empire ..	..	..	..	..	..	..	..	..	..	..	..	3 6
Rye Breeding Bibliography ..	..	..	..	..	..	..	..	..	..	..	..	1 6
Bibliography on Breeding Sorghums and Millets ..	..	..	..	..	..	..	..	..	..	..	..	1 0
Subject Index to Vols. I and II of Plant Breeding Abstracts ..	..	..	..	..	..	..	..	..	..	..	..	2 6

V. Obtainable from the Imperial Bureau of Plant Genetics (Herbage Plants), Welsh Plant Breeding Station, Agricultural Buildings, Alexandra Road, Aberystwyth, Wales.

Journal.

HERBAGE ABSTRACTS :—

												s. d.
Quarterly ..	..	..	..	..	..	..	..	..	..	..	..	1 6
Vol. I. Nos. 2 and 3, 1931 ..	..	..	..	..	..	..	..	..	..	..	..	3 0
Vol. 2, 1932. Annual Subscription (four numbers) ..	..	..	..	..	..	..	..	..	..	..	..	5 0(a)

SUPPLEMENT TO HERBAGE ABSTRACTS. Accounts of research work in progress in different countries, and any correspondence on herbage and forage matters. Subscription is at present (1932) included in that to Herbage Abstracts.

Occasional Papers.

BULLETINS :—

3. The Breeding of Herbage Plants: Technique adopted at the Welsh Plant Breeding Station, June, 1931 ..	..	..	..	..	..	..	..	..	..	..	..	3 0
4. Abstract-Review of Lucerne Literature during period 1925-30. September, 1931 ..	..	..	..	..	..	..	..	..	..	..	..	2 6
5. Research in Progress on Herbage Plants, Forage Crops and General Grass Land problems in the British Empire, September, 1931 ..	..	..	..	..	..	..	..	..	..	..	..	2 6
6. Research on Forage Crops in Soviet Central Asia, with special reference to Turkestan Lucerne, March, 1932 ..	..	..	..	..	..	..	..	..	..	..	..	1 6
7. Further contributions on the technique employed in the Breeding of Herbage and Forage Plants, May, 1932 ..	..	..	..	..	..	..	..	..	..	..	..	2 0

VI. Obtainable from the Imperial Bureau of Fruit Production, East Malling Research Station, East Malling, Kent.

Journal.

HORTICULTURAL ABSTRACTS. A quarterly abstract publication of current horticultural literature.

												s. d.
First issued, March, 1931 ..	..	..	..	..	..	..	..	..	..	..	..	1 6
Annual Subscription ..	..	..	..	..	..	..	..	..	..	..	..	5 0(a)

Occasional Papers.

TECHNICAL COMMUNICATIONS :—

1. 1930. Ringing of Fruit Trees (by D. Akenhead). Reprint. Agriculture and Live-stock in India. Vol. I, Part 1. January, 1931. Quarto. 5 pp. ..	..	..	..	..	..	..	..	..	..	..	..	1 0
2. 1931. Field Experiments on Horticulture (by T. N. Hoblyn). Quarto. 51 pp. Bibl. ..	..	..	..	..	..	..	..	..	..	..	..	2 0
3. 1932. Investigations on the standardisation of citrus trees by propagation methods ..	..	..	..	..	..	..	..	..	..	..	..	2 0
4. 1933. The manuring of fruit trees (in preparation).	..	..	..	..	..	..	..	..	..	..	..

Periodicals and other literature examined by the Imperial Bureau of Fruit Production. Stencil (under revision, in preparation).

Proceedings of First Imperial Horticultural Conference, 1930 :—

Part II. Papers on the application of science to horticulture ..	..	..	..	..	..	..	..	..	..	..	..	2 0
Part III. Papers on progress in fruit storage methods ..	..	..	..	..	..	..	..	..	..	..	..	2 6

(N.B.—Most of these papers may be obtained separately, price 3d.)

(a) The annual subscription to these Journals is being increased to 15/-.

VII. Obtainable from the Imperial Bureau of Animal Genetics, Animal Breeding Research Department, University of Edinburgh, King's Buildings, West Mains Road, Edinburgh.

Journal.

		Free. <i>s. d.</i>
Quarterly Bulletin (New Series), Vol. 1, commencing January, 1931	.. .. .. ..	5 0
Vol. 2, commencing January, 1932, per annum	.. .. ..	5 0
References to Literature contained in Periodicals received by the Bureau. Monthly. First issued in March, 1931. Per annum, within the Empire	.. .. .. ..	20 0

Occasional Papers.

The Genetics of the Horse (in collaboration)	.. .. .. ..	0 6
Bibliography on the Biology of the Fleece, 1931	.. .. .. ..	2 6
Bibliography on Fur Breeding, 1931	.. .. .. ..	1 0
Bibliography on the Genetics and Sex Physiology of the Rabbit	.. .. .. ..	2 6
The Physiological and Genetical Aspects of Sterility in Domesticated Animals (with Bibliography), 1932	.. .. .. ..	2 6
The Inheritance of High Milk Yield (in collaboration), 1932	.. .. .. ..	1 0
The Technique of Artificial Insemination, 1932	.. .. .. ..	1 6

VIII. Obtainable from the Imperial Bureau of Agricultural Parasitology, Institute of Agricultural Parasitology, Winches Farm Drive, Hatfield Road, St. Albans, Herts.

		<i>s. d.</i>
The Root-infesting Eelworms of the Genus <i>Heterodera</i> . A Bibliography and Host List, viii and 99 pp., 2 plates :—		
Paper Covers	.. .. .. ..	6 0
Printed on superfine paper, bound in green cloth	.. .. .. ..	8 6
Eelworms of the Genus <i>Heterodera</i> (Reprinted from "The Root-Infesting Eelworms of the Genus <i>Heterodera</i> "). 12 pp.	.. .. .. ..	1 0
Bibliography of Helminthology. For the year 1930, 62 pp. :—		
Paper Covers	.. .. .. ..	6 0
Printed on superfine paper, bound in green cloth	.. .. .. ..	8 6
* The Helminth Parasites of Common Rats (by J. N. Oldham, B.Sc., Ph.D.). 42 pp.	.. .. .. ..	2 0
* The Genus <i>Anguillulina</i> Gerv. & v. Ben., 1859, vel. <i>Tylenchus</i> Bastian, 1865 (by T. Goodey, D.Sc.). 106 pp.	.. .. .. ..	12 6
NOTES AND MEMORANDA :—		
* 1. On the Eelworm, <i>Heterodera schachtii</i> , as a potential danger to the Sugar-beet Industry in Britain. 8 pp.	.. .. .. ..	1 0
* 2. Hand-list of the Helminth Parasites of the Rabbit. 12 pp.	.. .. .. ..	1 0
* 3. The Kidney-worm of Swine: <i>stephanurus dentatus</i> . 12 pp.	.. .. .. ..	1 0
* 4. The Helminth Parasites of Deer. 32 pp.	.. .. .. ..	2 0
* 5. Differential Diagnosis of Plant-parasitic Eelworms. 12 pp.	.. .. .. ..	1 0
6. "Potato Sickness" and the Eelworm, <i>Heterodera schachtii</i> . 22 pp.	.. .. .. ..	2 0

* Reprinted from the *Journal of Helminthology*.

ADDRESSES OF THE IMPERIAL AGRICULTURAL BUREAUX

Imperial Bureau of—	Director.	Deputy Director or Chief Officer in direct Charge of Bureau.
Soil Science — Rothamsted Experimental Station, Harpenden, Herts, England.	Sir E. J. Russell, O.B.E., D.Sc., F.R.S.	G. V. Jacks, M.A., B.Sc.
Animal Health — Veterinary Research Laboratory, New Haw, Weybridge, Surrey, England.	W. Horner Andrews, D.Sc., M.R.C.V.S.	W. A. Pool, M.R.C.V.S.
Animal Nutrition — Rowett Research Institute, Bucksburn, Aberdeen, Scotland.	J. B. Orr, D.S.O., M.C., M.A., M.D., D.Sc., F.R.S.	F. C. Kelly, B.Sc., Ph.D., A.I.C.
Plant Genetics (for Crops other than Herbage) — Plant Breeding Institute, School of Agriculture, Cambridge, England.	Sir R. H. Biffen, M.A., F.R.S.	P. S. Hudson, Ph.D.
Plant Genetics (Herbage Plants) — Welsh Plant Breeding Station, Agricultural Buildings, Alexandra Road, Aberystwyth, Wales.	Professor R. G. Stapledon, C.B.E., M.A.	R. O. Whyte, E.Sc., Ph.D.
Fruit Production — East Malling Research Station, East Malling, Kent, England.	Ronald G. Hatton, M.A., V.M.H.	D. Akenhead, M.A., B.Sc.
Animal Genetics — Animal Breeding Research Department, University of Edinburgh, King's Buildings, West Mains Road, Edinburgh, Scotland.	Professor F. A. E. Crew, M.D., D.Sc., Ph.D., F.R.S.E.	F. Fraser Darling, Ph.D., N.D.A., N.D.D.
Agricultural Parasitology — Institute of Agricultural Parasitology, Winches Farm Drive, Hatfield Road, St Albans, Herts, England.	Professor R. T. Leiper, M.D., D.Sc., F.R.S.	J. N. Oldham, M.Sc., Ph.D. (St. Albans), B. G. Peters, M.Sc., Ph.D. (London Office).